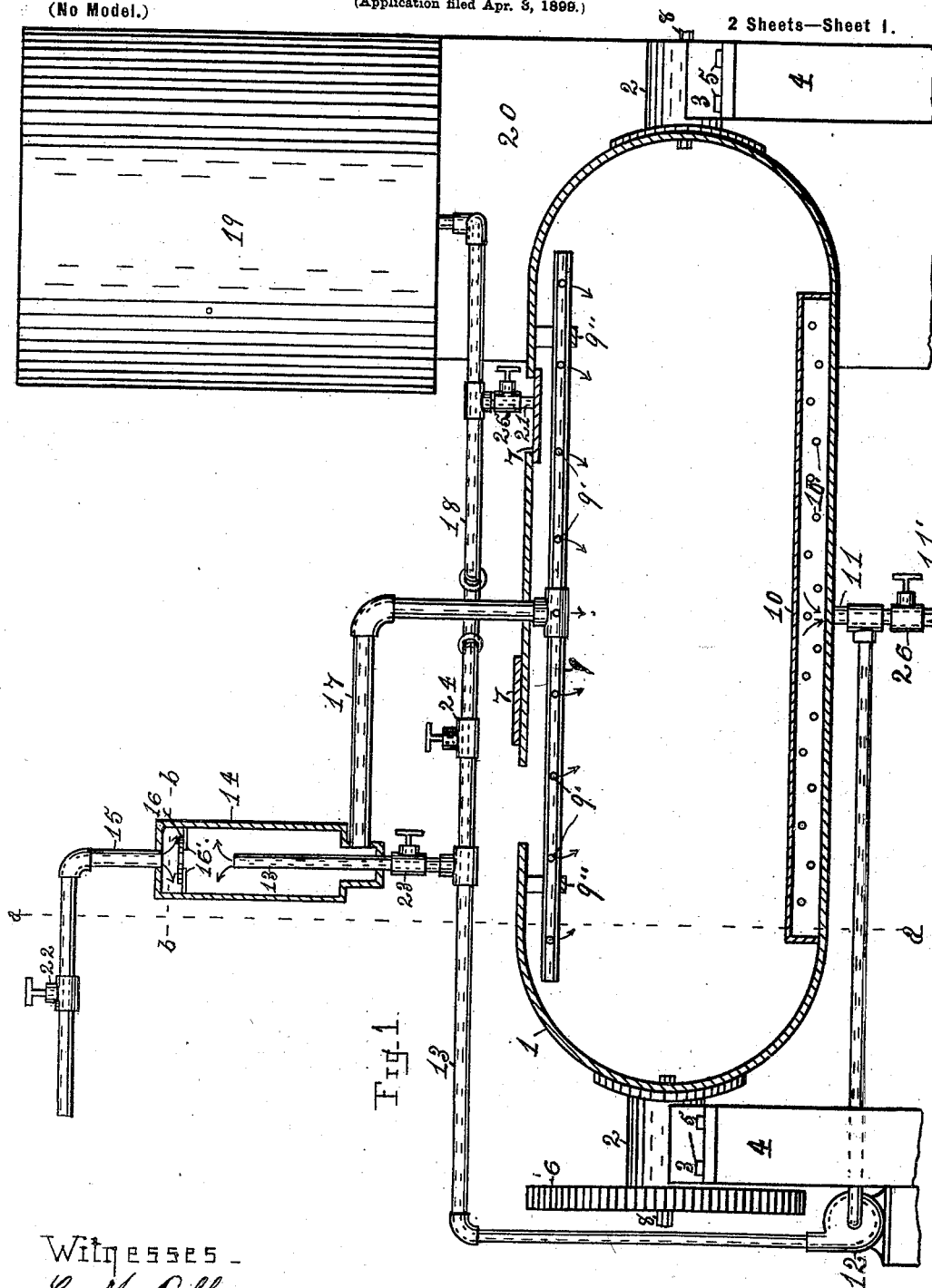


DECOLORIZING APPARATUS FOR PAPER STOCK.

(No Model.)

(Application filed Apr. 3, 1899.)

2 Sheets—Sheet 1.



Witnesses -
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No. 647,062.

Patented Apr. 10, 1900.

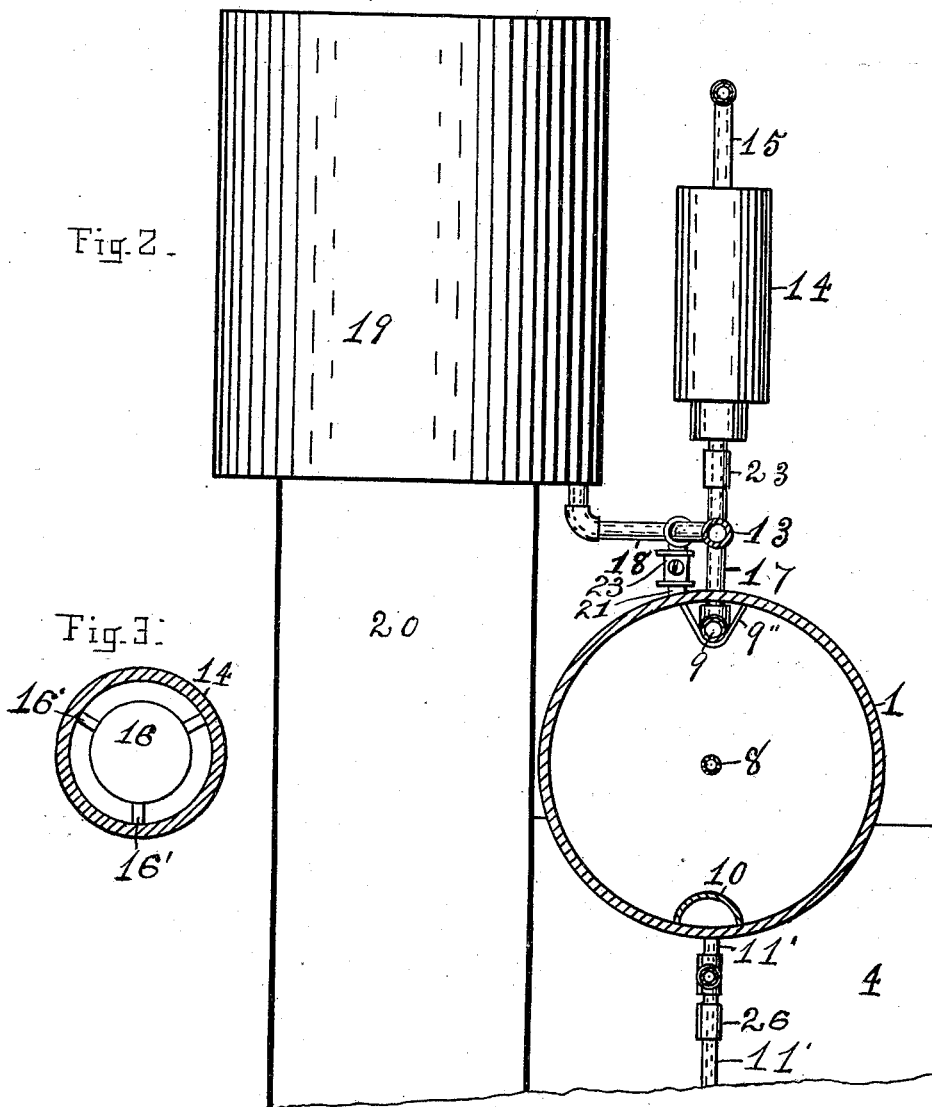
J. C. YOUNG.

DECOLORIZING APPARATUS FOR PAPER STOCK.

(No Model.)

(Application filed Apr. 3, 1899.)

2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

JOHN C. YOUNG, OF NEENAH, WISCONSIN, ASSIGNOR OF TWO-THIRDS TO
WILLIAM L. DAVIS AND JERRY H. WHITNEY, OF SAME PLACE.

DECOLORIZING APPARATUS FOR PAPER-STOCK.

SPECIFICATION forming part of Letters Patent No. 647,062, dated April 10, 1900.

Application filed April 3, 1899. Serial No. 711,631. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. YOUNG, a citizen of the United States, and a resident of Neenah, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Apparatus for Extracting Printed Matter or Colors from Paper-Stock before the Bleaching Process of Making White Paper of It, of which the following is a specification.

My invention relates in part to adapting the ordinary rotary bleach of paper-mills for use as a tank or receptacle in which to receive the waste paper to be treated and the necessary water and chemicals for extracting the ink or colors from said paper; but any suitable receptacle which is arranged for a thorough agitation of the paper-stock, so as to saturate its entire body evenly in every part of it before the cooking of said stock is commenced, may be used instead of the bleach.

As the bleach in a paper-mill is a necessary part and is not at all times in use, it is preferred as a receptacle in which to receive the paper-stock to be treated and is therefore represented; but it should be understood that although the term "bleach" is used for the receptacle in this specification said term includes, when used with my improvements, any suitable receptacle for holding paper-stock while it is going through the cooking process which is arranged for revolution so as to saturate the stock with the color-extracting chemical solution before the pump is started into operation for circulating the solution through the bleach and heater. It will be observed that one of the manhole-covers is not in position, it lying upon the top of the bleach and showing thereby that the bleach may be left open during the latter part of the cooking process, if desired. The steam that is used in heating the contents of the bleach is condensed by its mixture with the liquid used therein before it reaches the bleach, so that there is but little pressure of steam in the bleach.

My invention consists also of the application of a pump for producing a circulation of the chemical liquid through the paper-stock and of the arrangement of a heater for heat-

ing the liquid for extracting the color and also of the arrangement of a storage-tank for receiving and storing the liquid contents of the bleach, said apparatus being shown in the accompanying drawings, in which—

Figure 1 is a side elevation of the apparatus, showing the bleach and heating-tank in section. Fig. 2 is an end elevation taken upon the line *a a* of Fig. 1 as seen in looking toward the right, and Fig. 3 is a plan of the heating-tank upon the line *b b* of Fig. 1 upon a larger scale than the other figures.

Similar numerals indicate like parts in the several views.

1 indicates a rotary bleach; 2, its journals; 3, its journal-boxes; 4, walls or supports for said bleach journal-boxes; 5, bolts for securing the boxes to said supports; 6, a gear-wheel by which the bleach may be revolved; 7, manhole-plates in the bleach; 8, pipes entering bleach through journal-boxes for admitting steam thereto; 9, a pipe arranged upon the inside of the bleach, having numerous fine holes 9'; 9'', hangers for supporting said pipe; 10, a curved perforated plate along the bottom of the bleach for preventing paper from entering the discharge-pipe; 10', perforations therein; 11, the discharge-pipe; 11', a continuation of the pipe 11; 12, a rotary pump; 13, a pipe leading from the pump to a heating-tank; 14, a heating-tank; 15, a pipe entering the top of the heating-tank for admitting steam; 16, a deflecting-plate within the heating-tank; 16', arms connecting the deflecting-plate with the inside of the heating-tank; 17, a pipe leading from the heating-tank to the bleach; 18, a continuation of the pipe 13 for delivering liquids from the bleach to the storage-tank; 19, a storage-tank; 20, a wall or support for the storage-tank; 21, a branch pipe for delivering liquids from the storage-tank to the bleach; 22, the steam-pipe valve; 23, a valve in pipe 13; 24, a valve in pipe 18; 25, a valve in the pipe from the storage-tank to the bleach; 26, a valve in the pipe 11'.

The bleach 1 may be of boiler-iron and be made of the size and form suited to the requirements of the mill in which it is to be used and be provided with the usual chemical-proof lining and the usual pipes for ad-

mitting steam to its interior and with suitable gearing by which it may be revolved.

The bleach is provided with the usual man-hole-plates 7, and along its bottom a curved and perforated plate or sheet 10 is secured, which serves to hold the paper-stock from entering the discharge-pipe. Along the top of the bleach a perforated pipe 9 is arranged, which pipe is the terminus of the receiving-pipe 17, its purpose being to deliver the heated liquor in a fine spray upon the paper-stock along over nearly the entire length of the bleach.

At a convenient point a pump 12 is arranged for drawing the liquor from the bleach and elevating it into the heating-tank, from whence it will pass by its gravity into the bleach, the pipe leading from the heating-tank to the bleach being of larger capacity than the pipe which delivers to the heater.

The heater consists of a closed tank 14, having a steam-pipe 15 entering its upper end and the receiving-pipe 13 and discharge-pipe 17 its lower end. For the better intermingling and heating of the liquor of the bleach the pipe 13 is carried up inside of the heating-tank to near its upper end and is open. Just above the end of said pipe and under the entrance of the steam-pipe a deflecting-plate 16 is fixed, it serving as a deflector for both the liquid from the bleach and steam from the pipe 15, whereby the liquor and steam are intermingled and a larger body of liquor is acted upon by said steam and better heated than without said plate. The steam for this purpose should be exhaust-steam or steam of a low pressure.

At a convenient point and one higher than the bleach a storage-tank 19 is supported. A pipe 18 leads from the heater to said tank and also one from the tank to the bleach. The storage-tank is for the purpose of storing the liquor for extracting the ink or colors while the paper-stock is being removed from the bleach after it has been cooked for a sufficient length of time. Upon disconnecting the pipes 11, 17, and 21 and opening the manholes the bleach can be inverted and the paper-stock therein can be dumped upon the floor; after which it can be refilled with paper-stock, and the liquor which has been stored in the storage-tank can be let into the bleach and again used. After the strength of said liquor has become too weak for use or it is too much discolored it can be emptied from the bleach through the pipe 11' and a fresh supply prepared.

Cocks 23 are provided for the pipe 13, and 22, 24, and 25 for pipes 15, 18, and 21, respectively, pipe 11' having the cock 26.

The operation of the apparatus is as follows: The bleach is filled through its manholes with printed or colored paper-stock and about half full of water and the necessary chemicals for extracting the color. The pipes 11, 17, and 25 are then disconnected from the bleach, its covers secured in position for closing it, and it is made to revolve for a sufficient time to evenly saturate the paper-stock with the color-extracting liquid. The pump is then started after connecting the pipes 11, 17, and 25 with the bleach, and the liquid is drawn from the bleach and carried to the heating-tank. Steam is then let into the heating-tank and the liquor is heated and returned to the bleach. This liquor is then sprayed upon the paper-stock, filters down through it, and is again pumped up and passed through the heater. This cooking process is continued for several hours or until the ink and colors have been loosened and extracted from the paper-stock. After the paper-stock has been subjected to the action of the chemicals and steam or cooked for a sufficient time the liquor may be carried to the storage-tank and there held while the bleach is being emptied and a fresh supply of stock filled into it, when said liquor can be returned to the bleach for again being used.

In adapting the usual rotary bleach for use as a receptacle in which to cook the paper-stock preparatory to its being reworked into paper the bleach can be used one day for this purpose and the next for rags, wood-pulp, &c., and be revolved as usual, the pipes 11, 17, and 21 being connected to it or disconnected therefrom, as its use demands. In using the rotary bleach for this purpose a saving of some hundreds of dollars is effected over the cost of making and locating a special receptacle for said purpose.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus for cooking printed and other colored paper-stock for extracting the colors therefrom preparatory to bleaching the same for making paper, the combination of a suitable receptacle for holding said stock which is arranged for revolution, whereby said receptacle with the stock and color-extracting liquid therein may be revolved previous to said cooking, a steam-heated tank arranged for heating the color-extracting liquid, its discharging end being at a higher point than the top of said receptacle, a pipe leading from the bottom of said receptacle to said tank, a pump arranged intermediate the ends of said pipe for drawing liquids from said receptacle and delivering them to said tank and a pipe for the return to said receptacle by gravity of said liquids after their passage through the aforesaid tank, the pipe for conveying the liquids from said receptacle to the heating-tank, and the pipe for its return being arranged for detachment from the receptacle during the time it is being revolved, and connected with it during the time of the cooking operation of the paper-stock, substantially as described.

2. In an apparatus for cooking printed and other colored paper-stock for extracting the colors therefrom preparatory to bleaching the same for making paper, the combination of a

5 suitable receptacle for holding said stock
 which is arranged for revolution, whereby
 said receptacle with the stock and color-ex-
 10 tracting liquid therein may be revolved pre-
 vious to said cooking, a steam-heated tank
 arranged for heating the color-extracting liq-
 uid, its discharging end being at a higher
 point than the top of said receptacle, a pipe
 15 leading from the bottom of said receptacle to
 said tank, a pump arranged intermediate the
 ends of said pipe for drawing liquids from
 said receptacle and delivering them to said
 tank, a pipe for the return to said receptacle
 20 of said liquids after their passage through
 the aforesaid tank, said latter pipe having a
 finely-perforated pipe upon its lower end
 within, and extending nearly the entire length
 of said receptacle, whereby the liquids within
 said receptacle may be drawn from the bot-
 25 tom thereof, delivered into said heating-tank,
 thence descend by gravity into said perfor-
 ated pipe and be spread in a fine spray over
 substantially the entire surface of the paper-
 stock within said receptacle, the pipe for con-
 30 veying the liquids from said receptacle to the
 heating-tank, and the pipe for its return be-
 ing arranged for detachment from the recep-
 tacle during the time it is being revolved, and
 connected with it during the time of the cook-
 ing operation of the paper-stock, substan-
 tially as shown and described.

3. In an apparatus for cooking printed and
 other colored paper-stock for extracting the
 colors therefrom preparatory to bleaching the
 same for making paper, the combination of a 35
 suitable receptacle for holding said stock
 which is arranged for revolution, whereby
 said receptacle with the stock and color-ex-
 tracting liquid therein may be revolved pre-
 vious to said cooking, a steam-heated tank 40
 arranged for heating the color-extracting liq-
 uid, its discharging end being at a higher
 point than the top of said receptacle, a pipe
 leading from the bottom of said receptacle to
 said tank, a pump arranged intermediate the 45
 ends of said pipe for drawing liquids from
 said receptacle and delivering them to said
 tank, a pipe for the return to said receptacle
 by gravity of said liquids after their passage
 through the aforesaid tank, a storage-tank 50
 located at a higher point than the top of said
 receptacle, a pipe leading from said pump to
 the storage-tank and also one from the stor-
 age-tank to the aforesaid receptacle, where-
 by the liquids of said receptacle can be 55
 pumped from it to said storage-tank and then
 returned by gravity to said receptacle, sub-
 stantially as described.

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Witnesses:

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 M. W. KRUEGER.